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ABSTRACT

This instructor's lesson plan guide on the central nervous system is one of fifteen modules designed for use in the training of emergency medical technicians. Four units of study are presented: (1) anatomy and physiology; (2) assessment of patients with neurological problems; (3) pathophysiology and management of neurological problems; (4) demonstrations of techniques of management including spinal survey of an unconscious victim, use of the long and short spine board, use of orthopedic stretchers, and application of traction and cervical collar. Each unit contains these elements: behavioral objectives, teaching techniques, content outline, demonstration outline, and a list of needed equipment and materials. Skill evaluation sheets are provided. It is suggested that each module can be presented individually or combined with other modules to construct a course for a selected group of students. (CE 017 514 is a course guide for use in planning and implementing the total training program.) (JH)

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National Training Course
EMERGENCY MEDICAL TECHNICIAN
PARAMEDIC

INSTRUCTOR'S LESSON PLANS

Module – VII

Central Nervous System

CE 017 521

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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U.S. Department of Transportation / National Highway Traffic Safety Administration

National Training Course

EMERGENCY MEDICAL TECHNICIAN

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CE 017 521

HOW TO USE THE INSTRUCTOR LESSON PLANS

NOTES

The *Instructor Lesson Plans* are guides for teaching an advanced-level training program for emergency medical technicians. The *Plans* cannot be used by the instructor to develop the competency to conduct the program; the instructor should have this as a prerequisite to teaching the course.

The *Instructor Lesson Plans* are comprised of 15 modules, each containing the information and instructions needed to conduct a program on a particular subject. Each module can be used by itself or in concert with other modules.

Each module is subdivided into instructional units that deal with a particular segment of the module subject. Generally, the units contain the following components:

- *Performance Objectives.* These are classified as knowledge (K) objectives or skill (S) objectives. They are written in behavioral terms so they can be evaluated either through observation of student activities or through results obtained under specified conditions.
- *Unit Activities.* Reading assignments, reference materials, and outside activities are presented for both the students and the instructor. If the activities are identical, only the instructor's activities are presented.
- *Equipment and Materials.* Educational equipment includes chalkboard, overhead projector, slide projector, and screen. Medical equipment and materials required are drawn from those listed in Appendix F of the *Course Guide*.

- *Content Outline.* This presents the topics to be covered during the presentation of the unit. Where appropriate, it is divided into single skills or concepts. This approach gives the instructor the flexibility to add or delete specific skills and information. The content outline also provides directions to the instructor indicating when the use of demonstrations or group discussions would be most appropriate.

  Because the units are designed to be taught by technically competent instructors, the content outlines are not specific; they only enumerate topics and subtopics. It is expected that the instructor's skill and knowledge will supplement the depth of the course content outline. The instructor is encouraged to prepare additional notes.

- *Demonstration Outlines.* These are designed to present procedural steps that are important in performing the particular skill or calculation. Steps that are critical or that may lead to common errors are emphasized. Where critical steps exist, these outlines suggest what should be demonstrated.
- *Practice Sessions.* These sessions serve as guides to activities to be performed by students applying the skills. They may be performed in the classroom or assigned as homework. During classroom practice sessions, the instructor will be available to observe and correct student performance and to answer any questions.
- *Skill Evaluations.* The skill evaluation sheets provide checkpoints for the instructor to use to insure that students are following appropriate procedures or sequences. Skill evaluation sheets also provide a convenient method for feedback to students having particular problems with a given skill, and for monitoring a student's progress in attaining skill objectives.

  The skill evaluation should occur only after the students have had an opportunity to practice the skill under the supervision of the instructor. The skill evaluation sheets can be distributed during, or before, the demonstration or practice session. Thus, they can be used as a job aid during practice. They should not be used, however, as a job aid while the student is being evaluated. The sheets are designed to provide a learning and evaluation tool

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and are not intended to mandate performance in the field in a set manner, irrespective of the patient's condition or situation.

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Satisfactory performance of a given skill is defined as the correct performance of all steps in the proper sequence. The instructor's judgment is required to define correct performance and sequence of steps in a skill. Skill evaluations may be repeated at intervals throughout the course to assess skill decay and the need for remedial practice. Some instructors may wish to test skills immediately after they have been learned and again at the conclusion of the course.

The alphanumeric coding system is used to identify the various modules and units. When you see, for example, in Module II, **3.6.1.K**, the **3** indicates the unit, the **6** indicates the main instructional topic, the **1** indicates the subsection of the major topic outlined in **3.6**, and the **K** indicates the teaching objective (in this case, knowledge).

To illustrate further, **3.6.1.K** would translate into:

3 = Unit number
6 = The main topic of the instructional section (The first two numbers—e.g., **3.6**—refer to a major heading in the unit content outline.)
1 = A subsection of the major topic outlined in **3.6** (This number relates to the number of objectives listed under skill or knowledge objectives and not to the content outline.)
K = Knowledge objective
S = Skill objective

The three-digit reference numbers (e.g., **3.6.1**) within each module refer to the topical section in that module only. For example, in Module II, any topical heading with **3.6** as the first two digits refers to the discussion of the components of patient assessment in Unit 3.

A visual presentation of Unit 3, by Module II, of the coding system is presented on the following pages.

SAMPLE PAGE

CODING SYSTEM EXAMPLES

NOTES

- Abdomen
- Extremities

3.6.1.K Given a situation describing a patient with a possible illness or injury who may or may not be able to communicate, the student should be able to describe the procedure for evaluating the patient described. Minimally, the student should include the appropriate primary assessment and specify the order of the four components of the secondary assessment and the areas of the assessment that would be emphasized.

the demonstration, auscultation of the lung, heart, and abdominal sounds.

3.6.1.S Given a student posing as a communicative patient, the student should be able to demonstrate the procedure for conducting a patient assessment when the patient is suspected of having the following:

SAMPLE PAGE

CODING SYSTEM EXAMPLES

NOTES

8. Practice Session 3

3.6. Four components of assessment (order)

A. If the patient can communicate, determine if he has a medical or trauma-related problem.

1. If a medical problem, the general order should be:
   a. Evaluate the diagnostic and vital signs.
   b. Develop the patient's history.
   c. Examine for a medical problem.

Skill Evaluation 3.6.1.S: Assessment of a Communicative Patient With a Suspected Trauma-Related Problem

Place an "X" in the appropriate column to indicate steps that are incorrect, out of sequence, or omitted. The student should be given three attempts to perform the skill.

Equipment

Student posing as a victim
Stethoscope

Clinical Training

To present this program, it will be necessary to have access to the clinical units listed below. If a unit is not available, adjustments should be made to insure that the activities proposed for that unit are included in others. Specific guidelines for the clinical units are included in the modules. The student's training should be supervised in each of the following clinical areas:

- Emergency department
- Intensive care unit/coronary care unit
- Operating/recovery room
- Intravenous (IV) team
- Pediatric unit
- Labor suite/delivery room/newborn nursery
- Psychiatric unit
- Morgue
- Mobile intensive care unit

Sample forms for maintaining student activity records are included in the *Instructor Lesson Plans*. The forms are designed so that the medical director can determine the number of times, and how successfully, a student has performed a skill. The medical director also will be able to determine how much time the student needed to become proficient in the skill. Further, the medical director will be able to evaluate student performance under a number of preceptors, because certain skills are repeated in various clinical units (e.g., initiating an IV is performed by the student with the IV team and in the emergency department and intensive care unit).

Although the clinical experience is listed with the module, it need not be presented each time, even if a number of modules are being presented.

Testing and Evaluating the Student

It is recommended that each student be evaluated on proficiency of skill and knowledge at the completion of each module. Skill evaluation sheets have been provided for each skill in each unit. These sheets can be used as guides for evaluating the student's skill proficiency. The evaluation of the knowledge objectives is left to the discretion of the instructor, according to predetermined objectives.

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Testing of knowledge should stress areas of clinical relevance over basic science. No matter what type of evaluation system is used, students should be kept informed of their progress and should be given additional activities to supplement weak areas.

As previously stated, the emphasis is on student competency, rather than on the total number of hours the student is involved in the program. Thus, it is possible for the student to be tested and given credit for any module. The medical director should not assume the student's competency simply because of prior training, but should develop an evaluation method to determine the student's proficiency based on first-hand observation and experience. With this type of method, it is possible for students to receive credit for prior training experience. This would be especially applicable for those modules that are primarily a review of skills concerned with Emergency Medical Technician-Ambulance; for example, soft-tissue injuries and rescue.

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MODULE VII CENTRAL NERVOUS SYSTEM

INTRODUCTION

Prerequisites

The students must have successfully completed the following modules:

I. The Emergency Medical Technician, His Role, Responsibilities, and Training

II. Human Systems and Patient Assessment

III. Shock and Fluid Therapy

V. Respiratory System

Description of Module

Following is a summary of the topics discussed in this module:

Unit 1. Anatomy and Physiology: Includes a lecture, but no demonstrations or practice sessions.

Unit 2. Assessment of Patients with Neurological Problems: Includes a lecture, but no demonstrations or practice sessions, and discusses the following:

- What information to obtain for the history
- What should be done during the physical examination

- The need to concentrate on changes in the patient's condition
- How to conduct a neurological survey

Unit 3. Pathophysiology and Management of Neurological Problems: Includes a lecture, but no demonstrations or practice sessions, and discusses the following topics:

- Head trauma
- Spinal injury
- Medical problems

  — Coma (causes and management)
  — Seizures (causes, management, and types)
  — Status epilepticus (cause and management)
  — Stroke (cause and management)
  — Transient ischemic attacks (cause and management)

Unit 4. Techniques of Management: Includes a lecture and the following demonstrations:

4.1.1.S: Application of Traction, Cervical Collar, and Spinal Survey of a Conscious Victim
4.1.2.S: Spinal Survey of an Unconscious Victim
4.2.3.S: Use of the Long and Short Spine Board

The following review demonstrations are also included:

4.4.4.S: Log Roll of a Patient on a Long Spine Board
4.4.5.S: Straddle Slide
4.4.6.S: Use of Orthopedic Stretchers

There is no clinical experience unit in this module.

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UNIT 1 emt-p

ANATOMY AND PHYSIOLOGY

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Knowledge Objectives

After completing this module, the student should be able to correctly respond to at least 80 percent* of the following:

1.1.1.K Given a list of structures, the student should be able to select the structures that make up the central nervous system (brain, spinal cord).

1.1.2.K Given a list of at least four statements, the student should be able to select the one that best describes the function of the brain.

1.1.3.K Given a list of results, the student should be able to select the results of swelling of brain tissue or the accumulation of blood in the brain cavity.

1.1.4.K Given several lists of functions, the student should be able to select the primary functions of:

- Cerebellum
- Brain stem
- Spinal cord

*The selection of 80 percent as a passing criterion is arbitrary and can be modified.

1.1.5.K Given a diagram of the spinal canal and the following labels:

- Vertebral body
- Spinal canal
- Spinal cord
- Nerve root
- Spinous process

the student should be able to match the labels to the diagram.

1.1.6.K Given a list of results, the student should be able to select the results associated with damage to the sympathetic nervous system.

1.1.7.K Given a list of statements, the student should be able to select the statements that describe the function and color of cerebrospinal fluid.

Instructor Activities

Assign the following in the class period before the beginning of this unit:

- Chapter 7, Unit 1, of the *Text*
- Knowledge objectives for this unit

Prepare a lecture following the content outline on page VII-5. The following are suggestions:

- Introduce the unit (explaining the purpose).
- If possible, use anatomic charts of the brain and the spinal cord.
- As each structure is pointed out, discuss the structure's function or purpose.
- Emphasize the nerve-root function with respect to the body area.
- Review the function of the autonomic nervous system (Module IV).
- Discuss the peripheral nervous system, and the location and function of major nerves.

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Prepare a written test using the specified knowledge objectives.

Administer the test after the students have had an opportunity to study the material.

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Equipment and Materials

Equipment—Educational

Chalkboard and chalk

Equipment—Medical

Anatomical charts (brain and spinal cord)

Materials

Knowledge objectives (optional)
Written test (to be prepared by instructor)
Text

Content Outline

Introduction

- Explain that the central nervous system is to be discussed.
  - — Brain
  - — Spinal cord
- Have student read the knowledge objectives.
- Inform the students that this unit contains no demonstration or practice sessions.

1.1. Brain

A. General comments
1. Point out that the brain is a very soft and moist organ.
2. Point out that the brain is richly supplied with blood.
3. Point out that the brain is contained in the skull cavity. It is tightly enclosed in the skull with very little room for swelling that might occur after trauma.

4. Discuss the effects of swelling:
    a. Point out that one effect is the accumulation of blood in the cavity.
    b. Point out that one effect is the swelling of brain tissue itself.
    c. Point out that swelling affects intracranial pressure, which compromises the function of the brain.
5. Point out that the brain is a collection of nerve cells (millions).
    a. Each cell has a specialized function.
    b. Some cells receive sensory messages; some transmit motor messages.

B. Brain cells (specialization)
1. Point out that specialization is localized within brain areas.
2. Discuss each area (use chart or diagram).
    a. Speech center—located in the temporal lobe
    b. Vision—mediated in the occipital lobe
    c. Personality
    d. Motor
    e. Sensory
3. Point out that the right side of the brain controls the left side of the body.
4. Point out that left side controls the right side of the body.

C. Suspension system
1. Point out that the brain is suspended inside the skull by ligaments, the function of which is to prevent undue movement.
2. Discuss falx (located in the midline).
3. Discuss tentorium cerebelli (across the roof of the posterior fossa).
4. Discuss the phenomenon of "seeing stars" when struck on back of head (due to occipital poles of the brain banging against the back of the skull).

D. Parts
1. Cerebrum
    a. Location
    b. Function
    c. Proclivity for injury
    d. Results of injury

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2. Cerebellum—located in the inferoposterior part of brain
   a. Discuss the function—control of posture and equilibrium and the coordination of skilled movements.
   b. Point out that it is not very often injured.
   c. Point out that if it is injured, it will result in difficulties in balance and coordination.
3. Brain stem—located at the base of the brain
   a. Function—contains structures critical to the maintenance of vital functions
      (1) The medulla controls respiration and heart rate.
      (2) Damage will cause a variety of cardiorespiratory derangements, including arrest.
   b. Other functions
      (1) Point out that it controls the eyes, throat, and facial muscles.
      (2) Point out that from the brain stem, nerves run through a bony canal to the facial muscles.
      (3) Point out that a fracture of the bony canal may cause a nerve to be bruised or cut (if cut, paralysis of facial muscles occurs).
      (4) Discuss the eye—the oculomotor nerve causes the eye to constrict; if a blood clot puts pressure on the nerve, the pupils will not respond to light.

1.2. Spinal cord

A. Point out that the spine is a column of blocks with an anterior weight to hold the body erect, and a posterior ring called the neural arch.
B. Discuss its size (show a cross section of a spinal cord).
   1. Point out that it is 15 millimeters (mm) across (spinal canal).
   2. Point out that it is 10 mm in diameter (spinal cord).
   3. Point out that if the vertebral body is displaced 5 mm (1/5 inch), injury to the cord and paralysis might result.
C. Point out that in each spinal area (level), there are segmental neurons that supply local anatomical structures. (Discuss the nerve locations and body area involved.)

1. Regions
   a. Cervical
      (1) Seven vertebrae (C1-C7).
      (2) Eight nerves (C1-C8).
      (3) Susceptible to injury because of lack of support
   b. Thoracic
      (1) Twelve vertebrae (T1-T12)
      (2) Equal number of nerve roots
   c. Lumbar
      (1) Five vertebrae (L1-L5)
      (2) Equal number of nerve roots
   d. Sacral
      (1) Five fused vertebrae (S1–5)
      (2) Five nerve roots (S1–5)
   e. Coccygeal (tailbone)
      (1) Four vertebrae
      (2) One nerve root
2. Nerve root control (major nerve roots)
   a. C5: shoulder girdle
   b. C5, C6: elbow flexion
   c. C6, C8: elbow extension
   d. C6, C7: wrist movement
   e. C7, C8, T1: finger movement
   f. T4 through T10: thoracic region
      (1) T4: nipple line
      (2) T10: umbilicus
   g. L2, L3: hip flexion
   h. L4, L5: hip extension
   i. L3, L4: knee extension
   j. L5, S1: knee flexion
   k. S1, S2: ankle
   l. L5, S1, S2: toe movement

D. Point out that the spinal cord is smaller (shorter) than spinal column (ends at second lumbar vertebral body).

E. Point out that the spinal cord has many tracts. Three of these follow:
   1. Posterior column mediates position and vibratory sense.
   2. Lateral spinal thoracic tracts mediate pain and temperature.
   3. Cortical spinal tract controls movement.

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4. Names are not important—important fact is to check the spine-injured patient for:
   a. Position sense
   b. Pain
   c. Movement

F. Discuss the purpose of the autonomic nervous system (review from Module IV).
   1. Parasympathetic nervous system
      a. Vegetative function
      b. Vagus nerves
      c. Chemical mediator—acetylcholine
      d. Example—heart reaction to acetylcholine
      e. Drug
         (1) Atropine
         (2) Parasympathetic blocker
   2. Sympathetic nervous system
      a. Function (stress)
      b. Norepinephrine—chemical mediator
      c. Example—heart reaction to norepinephrine
      d. Others (hormone)
         (1) Adrenal gland—adrenalin
         (2) Epinephrine

G. Point out that the thoracic and lumbar portions house tracts of the sympathetic nervous system.
   1. Sympathetic nerves mediate changes in the arterial caliber.
   2. Damage may result in:
      a. Dramatic pooling of blood in the vascular system because of loss of vascular tone—shock
      b. Temperature regulation that may be disordered (peripheral vasoconstriction)

1.3. More comments about the central nervous system

A. Point out that the brain and spinal cord do not have the ability to regenerate if damaged.
   1. The brain, however, reroutes, and lost functions can be regained.
   2. The patient must be handled to prevent further damage.

B. Discuss protection.
   1. Bony structures

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2. Three layers of tissue (meninges)
   a. Outer layer (dura mater)—fibrous tissue that resembles leather
   b. Middle layer (arachnoid membrane)
   c. Inner layer (pia mater)
3. Fluid—space between the brain and the spinal cord and dura mater are filled with cerebrospinal fluid
   a. Point out that this fluid is clear and waterlike.
   b. Point out that it serves as a shock absorber and nourishment for some of the brain cells.
   c. Point out that leakage of fluid indicates that the skull has been fractured and the dura mater has been lacerated.

1.4. Peripheral nerves (Discuss the location, function, and area affected for each one.)

A. Upper extremity
   1. Axillary
   2. Musculocutaneous
   3. Radial
   4. Median
   5. Ulnar

B. Lower extremity
   1. Femoral
   2. Sciatic
   3. Obturator
   4. Peroneal
   5. Tibial
   6. Saphenous
   7. Sural

Summary

- Brain, spinal cord
- Function
- Specialization of cells
- Suspension system
- Results if damaged
- Peripheral nervous system

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UNIT 2 emt-p

PATIENT ASSESSMENT

NOTES

Knowledge Objectives

After completing this module, the student should be able to correctly respond to at least 80 percent* of the following:

2.2.1.K When asked, the student should be able to list what information should be collected when taking a history from a patient with suspected trauma of the spinal cord or from a patient with no related trauma.

2.3.1.K Given a list of procedural steps, the student should be able to put the steps into the correct sequence needed to do a physical examination on a patient with suspected head trauma.

2.3.2.K Given a list of activities, the student should be able to select those that need to be performed when a patient with a suspected cervical-spine injury does not have an open airway.

2.3.3.K Given a list of statements, the student should be able to select the statement that best describes the chain of events leading to respiratory arrest in a patient with a severe head injury.

*The selection of 80 percent as a passing criterion is arbitrary and can be modified.

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2.3.4.K Given a list of signs and symptoms, the student should be able to select the signs and symptoms associated with head trauma.

2.3.5.K Given a list of statements, the student should be able to select the statement that best describes the importance of changes in the patient's status.

2.3.6.K Given a list of statements, the student should be able to select the statement that best describes why behavioral terms should be used when describing a patient's state of consciousness.

2.3.7.K Given a list of statements, the student should be able to select the statement(s) that best describes "doll's eyes."

2.3.8.K Given a list of statements, the student should be able to select the statement that best describes when a check for "doll's eyes" should be made.

2.3.9.K Given a list of statements, the student should be able to select the statements that describe what changes the EMT should look for when monitoring a patient with suspected neurologic problems.

2.4.1.K Given a list of signs and symptoms, the student should be able to select the most reliable signs and symptoms of spinal-cord damage.

2.4.2.K Given a list of procedural steps, the student should be able to sequence the steps involved in conducting a check for paralysis on a patient who is communicative and on one who is noncommunicative.

2.4.3.K Given a list of reasons, the student should be able to select the reason why the lower extremities are checked first.

2.4.4.K Given several lists of conclusions, the student should be able to select the conclusion associated with a given observation or result of the check for paralysis (e.g., an

observation such as "cannot wiggle toes, but can raise arms").

2.4.5.K Given a list of reasons, the student should be able to select the reason why a check of the upper extremities should be conducted, if the check of the lower extremities reveals that there might be damage to the spinal cord.

Instructor Activities

Assign the following readings in the class period prior to the beginning of the unit:

- Chapter 7, Unit 2, of the *Text*
- Knowledge objectives for this unit

Prepare a lecture following the content outline on page VII-14. The following are suggestions:

- Introduce the unit and explain its purpose.
- Divide patient assessment into history and physical examination.
- Subdivide history into trauma and no related trauma.
- Stress the importance of the changing status of the patient and explain why initial status must be documented.
- In Section 2.3, have the student turn to the *Text* to look at the neurological examination record. (Discuss this record.)
- When discussing the check for paralysis, develop, on the chalkboard, a chart that displays observations of each of the tests and possible conclusions.
- When discussing the chain of events leading to respiratory insufficiency, list on the chalkboard the events in the order they occur.
- Summarize the unit after the lecture is complete.

Prepare a written test using the knowledge objectives.

Administer the test after the students have had an opportunity to study the material.

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Equipment and Materials

Equipment—Educational

Chalkboard and chalk

Equipment—Medical

Neurological examination record

Materials

Knowledge objectives (optional)
Written test (to be prepared by instructor)
Text

Content Outline

Introduction

- Explain that the purpose of the unit is to:

  — Discuss what history to collect
  — Discuss how the physical examination should be conducted

  for patients with suspected neurological problems

- Have the students read the specified knowledge objectives.
- Inform the students that there are no demonstrations or practice sessions.

2.1. Brief introduction (advanced organizer)

A. For clarity, patient assessment will be broken down into:
   1. Head (scalp wounds)
   2. Spinal cord trauma
   3. Patient assessment for neurological damage

B. The collection of a history for trauma and medical problems will be discussed.

2.2. History

A. Trauma related
   1. Often the patient is unconscious and unable to give a

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history; the history should then be collected from bystanders to determine the mechanism of injury.

2. Factors to consider or information to collect are the following:
   a. When did the accident happen?
   b. How did the accident happen?
   c. What were the mechanisms of injury?
      (1) Was a direct blow sustained?
      (2) Was injury primarily flexion, extension, or torsion?
   d. Has the patient moved or been moved?
   e. Are there any complicating factors, for example, medical problems or ingestion of drugs or alcohol?
   f. If patient is conscious:
      (1) Can he communicate?
      (2) What is his chief complaint?
      (3) Is he experiencing pain anywhere?
      (4) Is there numbness?
      (5) Is there tingling?
      (6) Is there paralysis?
      (7) Have the symptoms changed in any way?
      (8) Did the patient lose consciousness at any time?

B. Medical problem
   1. Uncommunicative patient
      a. Are there any clues at the scene?
      b. Are there any medications around?
      c. Does he wear a tag indicating he is epileptic or diabetic?
      d. Are there any liquor bottles?
      e. Are there bystanders from whom you can collect information?
   2. Communicative patient
      a. What is the chief complaint and type and quality of pain, if any?
      b. Does the patient have any underlying medical problems that may contribute to present condition?
         (1) Has he had any cardiac arrhythmias that might precipitate a syncopal episode?
         (2) Is he a chronic seizure patient? (Is he taking Dilantin?)
         (3) Is he a diabetic?

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2.3. Physical examination (head injury)

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A. Conduct a primary survey.
   1. Point out that the Emergency Medical Technician (EMT) must correct any life-threatening problems.
   2. Point out that the airway is usually in jeopardy when the patient is unconscious.
      a. If spinal cord damage is suspected, *do not* hyperextend the neck; use the chin lift or the jaw thrust.
      b. If the patient is unconscious, insert an airway; intubate if necessary.
   3. Discuss the causes of respiratory arrest.
      a. Blood flow from torn vessels in brain tissue exerts pressure on the surrounding tissue, possibly causing loss of some functions.
      b. Blood flow from the mouth and nose into the throat as a result of facial injuries.
      c. Gag reflexes absent.
      d. Tongue obstructs the throat.
      e. Blood flow into the lungs and stomach causes vomiting and further airway obstruction.

B. Take the vital signs.
   1. Changes in vital signs are important and suggest ways of management, so periodically record the vital signs.
   2. Vital signs are the following:
      a. Quality and rate of respiration
      b. Blood pressure
         (1) If high, suggests intracranial pressure
         (2) If low, indicates hemorrhage or neurogenic shock
      c. Pulse
         (1) If slow, may be due to increased intracranial pressure
         (2) If increased, may be due to shock

C. Conduct a head-to-toe survey.
   1. Pay particular attention to skull injuries.
      a. Closed
      b. Open
      c. Lacerations of scalp
      d. Skull fracture

2. Look for signs of skull fracture.
   a. Deformity of the skull
   b. Blood or clear fluid from the ears or nose
   c. Discoloration over the mastoid (Battle's sign) or under the eyes.
3. Take note of changes in:
   a. State of consciousness
      (1) Avoid descriptive terms, such as "stupor."
      (2) Use behavioral terms (i.e., discuss what the patient can and cannot do).
         (a) Can he respond to verbal stimuli?
         (b) Does he respond readily?
         (c) Are movements purposeful?
   b. Pupils
      (1) Are they equal?
      (2) Are they abnormally dilated/constricted?
      (3) Do they react directly and consensually to light?
      (4) Are contact lenses present?
   c. Extraocular motions
      (1) If conscious, have the patient follow your finger with his gaze.
      (2) If unconscious (and no spinal injury), check for "doll's eye" reflex.
         (a) Rotate head from side to side.
         (b) Remember the eyeballs should move to the side opposite motion of the head.
   d. Speech
      (1) Is the speech disordered?
      (2) Is the speech coherent and logical?
   e. Central nervous system checklist (see *Text*)
   f. Neck or spinal cord (check for injury—to be covered in the next section)

2.4. Physical examination (spinal injury)

A. Conduct a primary survey—open an airway using a chin or jaw lift.
B. Survey for spinal damage.
   1. Remember that this survey depends on the location of

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the patient. (If in doubt, immobilize before doing anything else.)

2. Look for the following signs and symptoms:
   a. Pain or tenderness—if the patient is conscious, gently run your fingers down the spine and note when the patient indicates pain
   b. Deformity (remove clothing if possible)—feel for bony protrusions
   c. Cuts and bruises—shoulder and lower back
   d. Paralysis of extremities

C. Check for paralysis (communicative patient).
   1. Check the lower extremities.
      a. Point out that the EMT should touch the patient's feet and legs and ask if he can feel the touch.
      b. Point out that the EMT should ask the patient to wiggle his toes and raise his leg.
      c. Point out that the EMT should ask the patient if he can tell that his toe is being moved up or down.
      d. Point out that loss of function occurs below a break in the spinal cord; thus, the survey is started at the lowest point—lower extremities.
      e. Discuss the results of the lower extremity check.
         (1) If the patient can perform a., b., and c., there is no indication of damage to the spinal cord anywhere along its length.
         (2) If the patient can perform these, but only to a limited degree and with pain, there may be pressure elsewhere on the cord.
         (3) If he cannot perform any of these, there is strong indication of severe damage to the spinal cord.
   2. Check on upper extremities.
      a. Point out that the EMT should conduct an upper extremities check regardless of the results of the check on the lower extremities; this will help to determine the location of the problem.
      b. Point out that the EMT should touch the patient's hands and arms and ask him whether he can feel the touch.
      c. Point out that the EMT should ask if the patient realizes his finger is being moved up or down.

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d. Point out that the EMT should ask the patient to grasp your hand and squeeze.

e. Discuss the results of the upper extremities check.

(1) If the patient can perform all of these, there is no indication of spinal-cord damage in the neck.

(2) If the patient can perform, but only to a limited degree and with pain, pressure on the cord in the area of the neck is indicated.

(3) If he cannot perform any of these, the damage first suspected in the lower extremities check is confirmed to be in the neck.

3. Attempt to pinpoint neurologic damage—perform dermatomal survey (review steps).

D. Check for paralysis (noncommunicative patient).

1. Use a pointed object and jab the patient lightly on the soles of the feet or ankle.

a. If the cord is intact in its entire length, the foot will pull back in response to the stimulus.

b. If there is damage, or the patient is deeply comatose, there will be no reaction.

2. If there is no response, repeat operation on palm of hands.

E. Note that when checking for paralysis, all the extremities must be checked (both right and left); paralysis on only one side may indicate stroke.

F. Check the reliability of the signs.

1. Spinal cord damage can exist with deformities, discolorations, pain and tenderness, and cuts and bruises.

2. The most reliable sign is the check for paralysis; but when in doubt, immobilize.

3. Signs need not be present; if the mechanism indicates possible damage, immobilize.

G. Monitor for changes in:

1. State of consciousness

2. State of the pupils

3. Presence of shock

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Summary

- History

— Trauma related
— No related trauma
— Important information

a. What is the mechanism of injury?
b. How long ago did the accident happen?
c. Are there any complicating factors?
d. Is there pain, numbness, etc.?

- Physical examination

— Head region
a. Conduct a primary survey (watch airway).
b. Check for skull injuries.
(1) Closed
(2) Open
(3) Fracture
c. Take the vital signs (note changes).
d. Note changes in:
(1) State of consciousness
(2) State of pupils
— Spinal region
a. Conduct a primary survey.
b. Conduct a secondary survey.
(1) Deformity
(2) Discoloration
(3) Tenderness and pain
(4) Check for paralysis
(a) Noncommunicative
(b) Communicative
c. Monitor the vital signs.
d. Note changes in:
(1) State of consciousness
(2) Pupils
(3) Paralysis

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UNIT 3 emt-p

PATHOPHYSIOLOGY AND MANAGEMENT

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Knowledge Objectives

After completing this module, the student should be able to correctly respond to at least 80 percent* of the following:

3.1.1.K Given a list of at least four statements, the student should be able to select the statement that best describes the most important aspect of assessment of the patient with head trauma.

3.1.2.K Given a list of activities, the student should be able to select those that need to be performed when doing a physical examination of a patient with a suspected head injury.

3.1.3.K Given a list of activities, the student should be able to select the one that needs to be performed when there is clear fluid flowing from the ear or nose of a head-injured patient.

3.1.4.K Given a list of at least four signs, the student should be able to select the signs associated with a skull fracture.

3.1.5.K Given a list of activities, the student should be able to select the one that needs to be performed when opening an

*The selection of 80 percent as a passing criterion is arbitrary and can be modified.

airway of an unconscious patient with a suspected cervical-spine injury.

3.1.6.K Given a list of patient conditions, the student should be able to select the conditions that should be treated first, given that the patient has the following:

- Cervical-spine injury
- Fractured arm
- Laceration of the thigh with venous bleeding
- First-degree burns of the chest
- Obstructed airway

3.2.1.K Given a list of accidents, the student should be able to correctly select the accidents commonly associated with neck or spinal injuries.

3.2.2.K Given a list of vertebrae labels or regions, the student should be able to correctly identify the labels for a given back location.

3.2.3.K Given a list of vertebrae labels and reasons, the student should be able to select the most commonly injured area and the reason why.

3.2.4.K Given a list of effects, the student should be able to select the effects of spinal-cord injuries (e.g., loss of function below the point of the spinal fracture).

3.2.5.K Given a list of reasons, the student should be able to select the reason why a patient with spinal injury should be kept covered with blankets.

3.2.6.K Given a list of activities, the student should be able to select those that need to be performed when managing a spinal injury.

3.3.1.K Given a list of at least four causes, the student should be able to select the potential causes of coma.

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3.3.2.K Given a list of activities, the student should be able to select those that need to be performed when managing a patient with coma from any cause.

3.3.3.K Given a list of drugs and reasons, the student should be able to select the drug and reason why it should be given to an unconscious patient.

3.3.4.K Given a list of potential causes, the student should be able to select the potential causes of seizures.

3.3.5.K Given a list of descriptions and the following labels:

- Generalized motor seizure (grand mal)
- Focal motor seizure
- Psychomotor (temporal lobe) seizure
- Petit mal seizure

the student should be able to match the label with the description.

3.3.6.K Given a list of statements, the student should be able to select those statements that are true about hysterical seizures.

3.3.7.K Given a list of events, the student should be able to select and sequence the events involved in a generalized motor seizure.

3.3.8.K When asked, the student should be able to list what information should be collected when obtaining a history on a patient with seizures.

3.3.9.K Given a list of general rules, the student should be able to select the rules to follow when managing a seizure patient.

3.3.10.K Given a list of objectives, the student should be able to select the objectives of managing a seizure patient.

3.3.11.K Given a list of definitions, the student should be able to select the best definition of status epilepticus.

3.3.12.K Given a list of causes, the student should be able to select the common cause of status epilepticus in adults.

3.3.13.K Given a list of activities, the student should be able to select the activities to perform when managing status epilepticus.

3.3.14.K Given a list of definitions, the student should be able to select the definition of stroke (cerebrovascular accident).

3.3.15.K Given a list of potential patients, the student should be able to select the patients most likely to experience a stroke.

3.3.16.K Given a list of causes, the student should be able to select the potential causes of a stroke.

3.3.17.K Given a list of definitions, the student should be able to select the best definition of transient ischemic attacks (TIA's).

3.3.18.K Given a list of factors, the student should be able to select the precipitating factors of TIA's.

3.3.19.K Given a list of signs, the student should be able to select the signs associated with TIA's.

3.3.20.K Given a list of activities, the student should be able to select the activities to perform when managing a patient who has had a cerebrovascular accident.

Instructor Activities

Assign the following during the class period prior to the beginning of this unit:

- Chapter 7, Unit 3, of the *Text*
- Knowledge objectives for this unit

Prepare a lecture following the content outline on page VII-25. The following suggestions are made:

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- Introduce the unit and explain its purpose.
- In the beginning of each topical section, briefly review what information the EMT should collect during the history and what he should look for during the physical examination. Then discuss the objectives and procedures of management.
- In Section 3.2, draw an illustration of the type of injuries that might occur to the spine. Show how a disc might compress the cord.
- If available, present X-rays of various skull and spinal cord injuries.
- In Section 3.2, when discussing the check for paralysis, have a diagram showing T10, T4, and C3. Also give the student practice in locating potential areas of trouble.

Prepare a written test using the knowledge objectives.

Administer the test after the students have had an opportunity to study the material.

Equipment and Materials

Equipment—Educational

Chalkboard and chalk

Equipment—Medical

X-rays of injuries

Materials

Knowledge objectives (optional)
Written test (to be prepared by instructor)
Text

Content Outline

Introduction

- Explain that the purpose of the unit is to discuss the pathophysiology and management of:
  - — Head trauma
  - — Spinal injury
  - — Medical problem

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a. Coma
b. Seizures
c. Strokes

- Have the students read the knowledge objectives.
- Inform the students that there are no demonstrations or practice sessions involved in this unit.

3.1. Head trauma

A. Point out that the most important aspect of assessment is whether the patient's neurologic examination is changing and how.
   1. Point out that an EMT will have to make repeated neurologic examinations both in the field and in transit.
   2. Point out that an EMT will have to keep accurate records.
   3. Point out that patients who show signs of improvement can be kept under observation.
   4. Point out that patients who show signs of deterioration may require urgent surgical intervention. (An EMT's observation in the field will be a great help.)

B. Discuss the history.
   1. Discuss its importance.
   2. List the information to be collected.
      a. What was the mechanism of injury?
      b. Did the patient lose consciousness?
         (1) When did it occur?
         (2) How long was he unconscious?
      c. Did he vomit (a child will often vomit)? In an adult, vomiting usually indicates serious intracranial pathology.
      d. What are the current symptoms?
         (1) Headaches
         (2) Dizziness
         (3) Double vision
         (4) Nausea
         (5) Weakness
      e. Is there pain anywhere else, particularly in the neck?

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f. Is there any numbness?

g. Has the patient ingested any drugs or alcohol?

C. Discuss the physical examination.

1. Repeat it several times.

2. Conduct a primary survey.

a. Point out that an EMT is *not* to move the patient until he is sure that there is no cervical-spine injury.

b. Point out that the patient with a head injury is assumed to have a cervical-spine injury until proven otherwise.

c. Point out that an EMT must be sure that the airway is open and that ventilation is adequate.

d. Point out that an EMT must check the presence and quality of the pulse.

e. Point out that an EMT must stop active bleeding with direct pressure.

f. Point out that an EMT must treat any other life-threatening problems (hemorrhage, sucking chest wound, etc.).

3. Take vital signs (repeat at least every 5 minutes).

a. Note the rate and quality of respiration.

b. Note if there is diaphragmatic breathing.

c. Note changes in blood pressure.

(1) Blood pressure rises as intracranial pressure rises.

(2) Falling blood pressure is almost never caused by head injury. Look for the major source of hemorrhage somewhere else in the body.

d. Note pulse.

(1) Slow pulse will accompany a rise in blood pressure indicating rising intracranial pressure.

(2) Rapid pulse may indicate shock from fluid elsewhere in the body.

4. Examine the patient's head.

a. Is there bleeding from the nose and ears?

b. Is there clear fluid from the mouth and nose? Do not attempt to block the flow of spinal fluid—just cover with sterile dressing.

c. Is there ecchymosis behind the ears?

d. Are there periorbital ecchymoses?

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NOTE: Ecchymosis behind the ears and periorbital ecchymosis suggest a basilar skull fracture.

5. Assess the patient's neck—apply and maintain manual traction, while you check for:
   a. Deformities
   b. Discolorations
   c. Pain
   d. Tenderness

   NOTE: There is a difference between a conscious and an unconscious patient. Check for paralysis.

6. Complete head-to-toe examination—watch for:
   a. Fractures
   b. Lacerations

   NOTE: Do not move the patient until you check the full length of the spinal column.

7. Conduct a neurological examination—state of consciousness.
   a. Is the patient alert?
   b. Is he oriented to persons, place, time?
   c. Does he answer questions and obey commands?
   d. Does he remember what happened?
   e. What kind of stimuli are required for him to respond?
   f. Is the movement purposeful?
   g. Is the movement restricted?

   NOTE: Use behavioral terms, not descriptive ones; the latter mean different things to different people.

8. Examine the eyes.
   a. Periorbital ecchymosis
   b. Extraocular motions
      (1) Check in all directions.
      (2) Check for "doll's eyes" (providing that there is no cervical spine injury and patient is unconscious).

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(3) Check pupillary size.
(4) Check reaction to light.

NOTE: Unequal pupils may not be too significant if the patient is awake and alert; however, enlargement (unilateral) of a pupil in an unconscious patient may mean swelling of the brain. This condition should be reported to the physician immediately.

D. Discuss general management of head trauma.
   1. Keep patient in supine position.
   2. Keep the airway open (watch for cervical-spine injury).
   3. If cervical-spine injury is indicated, maintain traction and apply cervical collar.
   4. Administer oxygen, and ventilate if necessary.
   5. Start intravenous (IV) fluid, D5W, to keep vein open.
   6. Monitor cardiac rhythm.
   7. Alert the hospital of patient's condition.
   8. Transport smoothly.

E. Discuss additional note on IV: Care must be taken that the patient not get too much fluid, which will worsen cerebral edema.

3.2. Spinal injury

A. Potential causes (mechanism of injury)
   1. Automobile accident
   2. Fall
   3. Diving accidents
   4. Sledding accidents

B. Types of injuries to areas of spine
   1. Thoracic vertebrae are splinted by the ribs.
   2. Lumbar region does not have the added protection of ribs; neither does the cervical region. (Injury is thus most common in these two areas.)

C. Types of injuries
   1. Point out that extreme binding or twisting may cause the vertebrae to collapse and compress.
   2. Point out that fragments of bone may break off and project into the canal, further compressing the cord.

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3. Point out that the disc may be dislocated and forced into the canal, compressing the cord.
4. Point out that all suspected injuries should be considered actual spinal-cord injury and be treated accordingly.

D. Effects of spinal-cord injury
1. There is a direct relationship between the location of a spinal-cord injury and a loss of function in the extremities. This relationship is based on the distribution of nerves that branch off the spinal cord.
2. Nerves carry messages from and to the brain.
3. If a nerve path is disrupted or interrupted, the function of the extremity will also be affected.
4. If the pathway is broken, the message cannot be carried, for example:
   a. A break at the third cervical vertebra will result in a loss of function below the break.
   b. If a break occurs in the area of the third lumbar, a loss of function will result below the lower back.

E. Brief review
1. History
   a. What is the mechanism of injury?
      (1) Flexion
      (2) Torsion
      (3) Extension
   b. What was the exact time of injury? If more than 6 hours have elapsed, chances of restoring lost functions are reduced.
   c. Is pain localized to the back or neck?
   d. Is there numbness or tingling?
   e. Are the extremities weak?
   f. Can the patient move? If he cannot, determine if anyone saw him move at any time after the accident.
   g. Has the patient moved or been moved since the accident?
   h. Have his symptoms changed since the accident?
2. Physical examination
   a. Conduct a primary survey.
   b. Take the vital signs.

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c. Conduct a head-to-toe survey.
   (1) Conduct with a minimum of movement to the patient.
   (2) Log roll the patient to inspect the spinal area. (Maintain traction.)

d. Inspect the spinal area.
   (1) Look for deformities.
   (2) Look for discolorations.
   (3) Locate areas of tenderness and areas of pain.
   (4) Look for paravertebral muscle spasm.
   (5) Check for open injuries.
   (6) Perform dermatome survey.
      (a) Point out that the umbilicus is at the 10th thoracic nerve (T10).
      (b) Point out that the nipple is around T4.
      (c) Point out that the clavicles are at C3.
      (d) Give the example that if sensation is present at the nipples, but absent between the umbilicus, the injury is probably between the 5th to 10th thoracic vertebrae.
      (e) Point out that the EMT must determine if strength is equal in all extremities—both left and right.

NOTE: Spinal injury may have damaged the sympathetic nervous system, and the patient may not be able to conserve body heat efficiently, so do not leave the patient uncovered for long periods of time.

F. Management
   1. Remember that management is primarily a supportive function to prevent further injury.
   2. Establish and maintain an airway. Watch for cervical-spine injury.
   3. Maintain axial traction, and immobilize the neck in a cervical collar or similar device (sandbags).
   4. Treat for shock.
   5. Administer oxygen. Assist ventilation as needed.
   6. Immobilize the patient on a long spine board.

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7. Start IV with D5W, to keep open.
8. Keep the patient covered to conserve heat.
9. Notify the hospital of the patient's condition.

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3.3. Medical problems

A. Coma

1. Causes (EMT must narrow down the possibilities.)
   a. Trauma (which may not be evident from a physical examination)—conduct a full neurological examination on any patient in a coma.
   b. Diabetes
      (1) Is there a Medic Alert bracelet?
      (2) Is patient carrying any medication?
      (3) Are there insulin syringes in the house?
      (4) Is there insulin in the refrigerator?
      (5) Does the patient's breath have a fruity odor?
   c. Other metabolic problems
      (1) Look for a Medic Alert tag.
      (2) Check the surroundings for medications (Synthroid, cortisone, etc.).
   d. Drug overdose
      (1) Are there needle marks?
      (2) Are the pupils pinpoint?
      (3) Are the respirations slow and deep?
      (4) Is the patient carrying any sedative drugs?
   e. Meningitis
      (1) Did the patient have severe headaches?
      (2) Did the patient have a fever?
      (3) Does he have a rash?
      (4) Is the neck rigid?
   f. Postictal state of seizures
      (1) Does the patient have a known history of seizure?
      (2) Did anyone see the seizure?
      (3) Is he carrying Dilantin, phenobarbital, or mysoline?
   g. Hypertensive emergency and stroke
      (1) What is the blood pressure?
      (2) Are the pupils equal?
      (3) Is there paralysis on either side?

(4) Is the patient carrying any hypertensive medication?

h. Alcoholic stupor—Is there alcohol on the patient's breath?

NOTE: Do not be fooled, however; the patient may have a coma from some other cause.

2. Physical examination
   a. Note the rate and quality of respirations.
   b. Look for injury elsewhere.
   c. Conduct a neurological examination (same as for head injury).
3. Management
   a. General principles
      (1) Protect the airway from aspiration.
      (2) Insure adequate ventilation.
      (3) Insert an airway.
      (4) Intubate, if necessary.
      (5) Administer oxygen.
   b. Specific steps
      (1) Maintain an airway.
      (2) Intubate, if necessary.
      (3) Administer oxygen.
      (4) Keep the patient flat; draw a blood sample.
      (5) Start an IV with D5W, to keep open.
      (6) Obtain orders to administer a glucose IV.

NOTE: Regardless of the underlying cause of a coma, glucose will do no harm and will prevent irreversible death of brain cells if hypoglycemia occurs.

      (7) Monitor the patient.
      (8) Transport.
   c. Special note on treatment—if pupils are pinpoint, consult physician about Narcan.

B. Seizures
   1. Define as a massive discharge of a group of neurons in the brain.
   2. Discuss the causes.
      a. Stroke, recent or remote

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b. Head trauma, recent or remote
c. Withdrawal from drugs or alcohol
d. Hypoxia
e. Hypoglycemia
f. Meningitis
g. Idiopathic (cause unknown)

3. Discuss the types and their characteristics.
   a. Generalized motor seizure (grand mal)
      (1) Discuss loss of consciousness.
      (2) Discuss tonic-clonic movements.
      (3) Point out that sometimes there is tongue biting.
      (4) Discuss incontinence.
      (5) Discuss mental confusion.
      (6) Point out that the period after extreme activities is followed by coma or drowsiness (postictal state).
   b. Focal motor seizure
      (1) This seizure usually involves one part of the body (e.g., face or arms).
      (2) Seizure may progress into generalized convulsions.
      (3) If the seizure is witnessed, it is important to note where it started (left side of face, etc.).
   c. Psychomotor (temporal lobe) seizure
      (1) Altered personality state
      (2) Preceded by dizziness
      (3) Metallic taste in mouth
   d. Petit mal seizure
      (1) Often seen in children
      (2) Loss of consciousness without loss of motor tone

4. Discuss how to differentiate between the above seizures and hysterical seizure.
   a. Point out that a hysterical seizure represents psychological disorders.
   b. Discuss hysterical seizures.
      (1) Movements are more bizarre.
      (2) Seizures can often be interrupted by sharp voice command.
      (3) The person rarely injures himself.

(4) Seizures usually take place in front of an audience.

c. Point out that to help differentiate, consider the sequence of events of a generalized motor seizure.

(1) "Aura"

(a) Visual or auditory hallucinations

(b) Particular taste in the mouth

(c) Painful sensation in the abdomen

(d) Sense of movement in some part of body when there is no movement

(2) Loss of consciousness

(3) Tonic phase

(a) Lasts 15–20 seconds

(b) Continuous motor tension

(4) Hypertonic (tetanic) phase

(a) Lasts 5–15 seconds

(b) Extreme muscular rigidity

(c) Hyperextension

(5) Clonic phase

(a) Spasm in which rigidity and relaxation alternate in rapid succession

(b) Loss of sphincter control and incontinence

(c) Autonomic discharge, with hyperventilation, salivation, tachycardia

(d) Postictal stupor

(e) Confusion and headache

5. History

a. Does the patient have a history of seizures?

b. How frequently do they occur?

c. Does the patient take medication?

d. What is the description of the seizure from bystanders? If not witnessed:

(1) Was there an "aura"?

(2) Did it begin in one area of the body?

(3) In which direction did the eyes deviate?

e. Does the patient have recent or remote history of head trauma?

f. Is there a history of diabetes, heart disease, stroke?

g. Is there a history of drug abuse or alcohol abuse?

h. Had the patient had a recent fever, headache, or stiff neck, which might indicate meningitis?

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6. Physical examination
   a. Look for signs of head injury, injury to the tongue, and trauma elsewhere in the body.
   b. Look for signs of alcohol, or drug abuse.
   c. Conduct a thorough neurological examination.
   d. Look for irregular cardiac rhythm.
7. Treatment or management
   a. General objectives
      (1) Maintain an open airway.
      (2) Prevent the patient from injuring himself.
   b. General rules
      (1) *Do not* restrain during the clonic-tonic phase.
      (2) Remember that the use of a biteblock or padded tongue blade is usually questionable.
      (3) If teeth are not already clenched, place a gauze-wrapped tongue depressor between molars.
      (4) Never place anything in the mouth if the teeth are already clenched.
      (5) If possible, remove dentures.
      (6) Maintain an airway and administer oxygen.
      (7) After the tonic-clonic phase, turn the patient to his side and continue maintaining the airway.
      (8) Keep the patient quiet.
      (9) Avoid tight restraints.
      (10) Transport him lying down.
      (11) Administer oxygen en route.

C. Status epilepticus
   1. Define as two or more seizures without an intervening period of consciousness.
      a. Considered a dire emergency
      b. May lead to:
         (1) Aspiration
         (2) Anoxia
         (3) Brain damage
         (4) Fractured bone (spine)
         (5) Cardiac muscle necrosis
         (6) Severe dehydration
      c. Common cause in adults—failure to take prescribed seizure medications
   2. Discuss treatment.
      a. Place the patient on the floor, away from furniture.

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b. Clear and maintain an airway.
c. Administer oxygen, assist in ventilation.
d. Draw a blood sample.
e. Start an IV with D5W (secure the IV with tape).
f. Obtain orders to give glucose by IV push.
g. If seizures do not stop, physician may order diazepam (Valium).
h. Monitor the blood pressure.

D. Stroke (cerebrovascular accident)
1. Define as a sudden vascular catastrophe, usually a clot or hemorrhage in the brain.
2. Discuss the symptoms.
a. Weakness
b. Paralysis
c. Speech disorder
d. Coma
e. Confusion
3. Discuss the victims.
a. Usually over 50 years of age
b. Young women taking oral contraceptives
c. Young blacks with sickle-cell disease
d. Patients with history of heart disease or hypertension
4. Discuss the causes.
a. Occlusion of blood vessel in the brain—arteriosclerosis, embolization, or both
b. Leakage of blood from vessels in the brain
5. Discuss TIA's
a. Point out that they are called "little strokes."
b. Point out they usually occur a month before the cerebrovascular accident; they can last a few seconds to 12 hours.
6. Discuss the history
a. Did the patient ever have TIA's?
b. Does the patient have a history of:
(1) Hypertension
(2) Cardiac disease
(3) Diabetes
(4) Sickle-cell disease
(5) Taking birth-control pills
c. What were the first symptoms?

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d. Did anything seem to precipitate the symptoms?
e. Did patient experience dizziness or palpitations?
f. Is patient left or right handed?

7. Discuss the physical examination.
   a. Obvious or subtle signs
   b. Signs:
      (1) Hemiparesis (weakness on one side of the body)
      (2) Hemiplegia (paralysis on one side of the body)
      (3) Speech disturbances
      (4) Inability to understand
      (5) Headache
      (6) Confusion
      (7) Staggering gait
      (8) Visual disturbances
      (9) Excessive laughing or crying
      (10) Coma
8. Discuss management.
   a. Keep the patient flat.
   b. Maintain an airway.
   c. Administer oxygen.
   d. Monitor—if comatose or arrhythmias, start IV with D5W, to keep open.

UNIT 4 emt-p

TECHNIQUES OF MANAGEMENT

NOTES

Knowledge Objectives

After completing the module, the student should be able to correctly respond to at least 80 percent* of the following:

4.1.1.K Given a list of activities, the student should be able to identify those needed to be performed when checking for paralysis in an unconscious patient.

4.1.2.K Given a list of activities, the student should be able to identify those needed to be performed when a cervical collar is not available or cannot be used because of deformities.

4.1.3.K Given a list of procedures, the student should be able to indentify the procedures to use when applying and maintaining traction on a patient with a cervical-spine injury.

4.2.1.K Given a list of activities the student should be able to indentify those needed to be performed when immobilizing a patient with a suspected spine injury and bleeding.

4.2.2.K Given a list of steps sequenced in various orders, the student should be able to identify the sequence of steps involved in treating an unconscious breathing patient with

*The selection of 80 percent as a passing criterion is arbitrary and can be modified.

a cervical-spine injury and severe bleeding when direct pressure is not stopping the bleeding.

4.2.3.K Given a list of equipment, the student should be able to correctly identify which equipment to use in immobilizing a patient with a spine or neck injury in the following situations:

- A seated automobile-accident victim
- A victim found 11 inches from an immovable wall

4.2.4.K Given a list of locations, the student should be able to correctly identify the location(s) to place padding under a patient when using a short spine board and a long spine board with straps.

4.3.1.K Given a list of activities, the student should be able to correctly identify those needed to be performed when treating a near-drowning victim with a suspected cervical-spine injury when the patient is found floating face down in the water.

4.4.1.K Given a list of body locations, the student should be able to correctly identify the locations in which the patient is lifted onto a long spine board when the straddle technique is used and the log-roll technique is used.

Skill Objectives

After completing this module, the student should be able to correctly perform each of the skill objectives. "Correctly" will be defined by the instructor during the lecture and demonstration sessions. Skill evaluation sheets are included in the module.

4.1.1.S Given a fellow student posing as a conscious victim in the supine position, with a suspected spinal injury and with no gross deformities; a fellow student for an assistant; a cervical collar, sandbag, or towel; and blankets and straps, the student should be able to:

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- Apply traction to him while the assistant surveys him for spinal damage, checks for paralysis, and applies a cervical collar or a horse collar.
- Survey the patient for spinal damage, check for paralysis, and apply a cervical collar or a horse collar while the assistant applies traction.

Successful performance requires only that the standard procedures and techniques be used and that the student complete both activities. Successful performance *does not* involve the complete immobilization of the patient.

4.1.2.S Given a fellow student posing as an unconscious victim in the supine position, with a suspected spine injury and with no gross deformities; a fellow student for an assistant; and a pencil or suitable sharp object, the student should be able to survey the patient for spinal damage and check for paralysis while the assistant applies traction. Successful performance *does not* involve the application of a cervical collar, traction, or the complete immobilization of the patient; it involves only the check for spinal damage and paralysis.

4.2.1.S Given a fellow student posing as a conscious, seated, automobile-accident victim with a suspected spine injury and with no gross deformities, a short spine board, six straps, cervical collar, seven towels or other suitable materials, long spine board, head- and chinstraps or roller gauze, an automobile, and two fellow students as assistants, the student should be able to correctly and completely immobilize the patient. The assistants should only be permitted to perform activities as directed by the student under evaluation, and their activities should be limited to:

- Applying traction
- Positioning the long spine board
- Assisting the patient onto the long spine board

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Successful performance involves:

- Direction of the assistants in their responsibilities
- Application of cervical collar
- Immobilization of patient on short spine board
- Immobilization of patient on long spine board

The student's performance should be judged on the adherences to standard procedures as well as on how well the victim is immobilized. (Review from EMT basic training.)

4.4.1.S Given a fellow student posing as a victim with a suspected spine injury in the supine position, a long spine board, and four towels or other suitable materials, five students working as a team should be able to correctly log roll the patient onto the long spine board. Successful performance involves the adherence to the accepted procedures in using the log-roll technique and the coordination of the team members to log roll the patient without causing further damage.

4.4.2.S Given a fellow student posing as a victim with a suspected spine injury in a supine position, a long spine board, and four towels or other suitable materials, four students working as a team should be able to correctly slide the patient on the long spine board using the straddle technique. Successful performance involves the adherence to the accepted procedures in using the straddle slide and the coordination of the team members to place the patient on the long spine board without causing further damage.

4.4.3.S Given a fellow student posing as a conscious victim in the prone position, with a suspected lumbar spine injury; an orthopedic stretcher; two fellow students as assistants; and three straps, the student should be able to correctly immobilize and secure the patient on the orthopedic stretcher. Successful performance involves the adherence to the accepted procedures in using the orthopedic stretcher and the immobilization of the patient's lower back region. The assistants will *only* be permitted to:

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- Attach the foot of the stretcher
- Position the patient so that the scoops can be placed under the patient by the student

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Instructor Activities

Assign the following during the class period before this unit is to begin:

- Chapter 7, Unit 4, of the *Text*
- Knowledge objectives for this unit
- Skill objectives for this unit

Prepare a lecture following the content outline on page VII-45. The following demonstrations are included:

4.1.1.S Application of Traction and Cervical Collar and Check for Paralysis on a Conscious Patient
4.1.2.S Spinal Survey of an Unconscious Patient
4.2.3.S Use of the Short and Long Spine Board

In addition, review, by demonstration, the following basic EMT skills:

4.4.4.S Log Roll of Patient to a Long Spine Board
4.4.5.S Straddle Slide
4.4.6.S Use of an Orthopedic Stretcher

When discussing this material, explain how to handle the following situations:

- Resuscitation of a victim with a suspected cervical-spine injury
- Control of severe hemorrhage with a patient with a suspected spinal injury

Conduct two practice sessions for the students involving the above six skills; practice session outlines are provided.

Prepare a written test using the knowledge objectives.

Administer the test after the students have had time to study the material and practice the skills.

Evaluate the students on their ability to perform the six skills; skill evaluation sheets are provided. Evaluate the students by setting up the following skill-evaluation stations:

Station 1: Conscious and unconscious patient—spinal survey, maintaining traction, and applying cervical collar
Station 2: Use of the long and short spine boards
Station 3: Log roll—straddle slide and use of orthopedic stretcher

Equipment and Materials

Equipment—Educational

Chalkboard and chalk
Slide projector (if slides are used to show how to handle a diving victim with a suspected spinal injury)

Equipment—Medical

Automobile
Short spine board
Long spine board
Straps
Cervical collar
Towels
Head- and chinstraps
Roller gauze
Orthopedic stretcher
Blankets
Sandbags
Pin or other suitable sharp object

Materials

Content outline
Demonstration outlines
Practice session outlines
Skill-evaluation sheets
Knowledge objectives
Skill objectives
Written test (to be prepared by instructor)
Text

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Content Outline

NOTES

Introduction

- Explain that the purpose of the unit is to demonstrate:

  — Application of traction and a cervical collar and survey of a conscious patient
  — Spinal survey of an unconscious patient
  — Short and long spine board to immobilize the patient

- Explain that another purpose is to review how to:

  — Log roll a patient to a long spine board
  — Use a straddle slide
  — Use an orthopedic stretcher

- Inform the students that there will be two practice sessions.
- Have the students read:

  — Knowledge objectives
  — S objectives

4.1. Application of traction and cervical collar and checking for paralysis

A. Ask the students to recall the steps in checking for paralysis.
B. Display a cervical collar.
C. Ask the students to discuss possible substitutes:
   1. Horse collar
   2. Sandbags
D. Introduce Demonstrations 4.1.1.S and 4.1.2.S.

4.2. Complete immobilization of a patient with short and long spine boards (review from Unit 3).

A. Introduce Demonstration 4.2.3.S.
B. Explain that other situations may present themselves other than the situation depicted in the demonstration, but the principles are the same.

4.3. Diving accident

A. Point out that usually a diving-accident victim will have sustained a cervical-spine injury.
   1. The victim must be approached with this fact in mind; otherwise permanent damage may result.
   2. The following procedures should be observed (use slides during this section, if available):
      a. The EMT approaches the patient from the vertex and places one arm under his body so the victim's head is supported on the EMT's arm and his chest on the EMT's hand. The other arm is placed across the victim's head and back, to splint his head and neck between the EMT's arms.
      b. The EMT continues to support the patient's head and neck in that fashion, and smoothly turns him to the supine position. If he is not breathing, the EMT begins mouth-to-mouth resuscitation immediately, while still in the water.
      c. A second rescuer slides a rigid device—such as a wooden blackboard, surfboard, door, wooden plank—under the patient's body while the first rescuer continues to support the patient's head and neck. A cervical collar or other device to further stabilize the neck is then applied.
      d. The board is then floated to the edge of the water and lifted out, with one rescuer stabilizing the patient on the board to prevent undue motion.
      e. When the board has been removed from the water, the patient is securely fastened to the board with straps. An inflatable splint may be passed gently behind the patient's neck and inflated to serve as a neck roll. The patient's head must also be stabilized with roller bandages or sandbags.

B. Introduce Practice Session 1.

4.4. Other useful skills (Review from EMT basic training.)

A. Demonstrations 4.4.4.S, 4.4.5.S, and 4.4.6.S
B. Practice Session 2

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Demonstration 4.1.1.S: Application of Traction and Cervical Collar and Check for Paralysis on a Conscious Patient

NOTES

Equipment

Cervical collar
Sandbags
Towels
Manikin or student posing as victim
Straps
Blankets

Procedures

Have equipment and materials ready before demonstration is to begin.

Tell the students that the demonstration assumes:

- Patient is conscious
- Primary survey has already been conducted, and there is no life-threatening problem
- Patient has no respiratory problem

Demonstrate so that all the students can see and hear.

Explain every step as it is performed.

Steps

1. Determine if gross deformities exist.
   a. Explain why (key to spinal injury).
   b. Explain how to determine.
   c. Explain what to do if deformities exist.
   d. Explain what to do if they do not exist.
2. Apply and maintain traction.
   a. Show the location of the rescuer.
   b. Show the location of rescuer's hands and fingers.
   c. Explain and show how to exert outward pull.
   d. Explain how long to maintain traction.
3. Determine if the patient is conscious.
   a. Explain how to determine.

b. Discuss the difference in procedures between conscious and unconscious patient. (See Demonstration 4.1.2.S.)

4. Ask patient which area of spine is possibly injured.
   a. What to do if the patient does not indicate any pain.
   b. What to do if the patient indicates pain (i.e., inform patient of every action).
5. Observe patient during procedures for any movement and associated pain.
   a. Do not ask the patient to move.
   b. If the patient moves, request that the movement be minimized.
6. Move fingers across the injured area.
   a. Demonstrate the procedure.
   b. Explain the purpose.
   c. Explain how to do this if the patient is not in an accessible position for procedure.
7. Check lower extremities for paralysis.
   a. Explain and demonstrate the procedures:
      (1) Touch
      (2) Wiggle
      (3) Raise legs
      (4) Exert pressure
   b. Explain what to do if the patient can and cannot perform.
8. Check the upper extremities.
   a. Explain and demonstrate the procedures.
   b. Explain what to do if the patient can and cannot perform.
   c. Explain the meaning and conclusion from observations of checking lower and upper extremities.
   d. Explain how the other areas should be checked.
9. Dress any external hemorrhage of the spinal area.
   a. Explain why the wounds are not dressed before this.
   b. Explain how.
10. Determine the selection of equipment.
    a. Briefly explain the equipment.
    b. Briefly explain the purposes of the equipment.
11. Demonstrate the procedures to immobilize the neck.
    a. Demonstrate how to attach a cervical collar.
    b. Demonstrate how to make and secure a horse collar.
    c. Demonstrate how to use sandbags as alternative material.
12. Discuss what other measures should be performed.
    a. Monitoring vital signs

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b. Recording the results of a neurological survey
c. Noting possible administration of drugs, etc.

After the demonstration has been completed, ask the students if they want any or all of the steps repeated. If time allows, have at least one student perform the demonstration.

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Demonstration 4.1.2.S: Spinal Survey of an Unconscious Patient

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Equipment

Student posing as a victim or an adult manikin
Student as an assistant
Pin or other suitable sharp object

Procedures

Have all the equipment and materials ready before the demonstration is to begin.

Inform the students that you are going to:

- Assume a primary and a secondary survey have been done and the patient has no cardiac or respiratory problem and no severe hemorrhage.
- Stop the demonstration before it is necessary to completely immobilize the patient (since this will be discussed in the next demonstration).

Describe each step as it is demonstrated.

Demonstrate so that all the students can see and hear.

Steps

1. Determine if the patient is conscious.
   a. Explain how to determine this.
   b. Assume the patient is unconscious.
2. Review the initial steps.
   a. Determine if gross deformities exist.
   b. Apply and maintain traction.
3. Check for paralysis of the lower extremities.
   a. Explain and demonstrate the procedure.
   b. Explain the reaction if there is no spinalcord damage.
   c. Explain what to do if spinal-cord damage is indicated.
4. Check for paralysis of the upper extremities.
   a. Explain and demonstrate the procedure.
   b. Explain the reaction if there is no spinalcord damage.
5. Determine the location of the injury using data or information gathered in the paralysis check.
6. Review the remaining procedures.

Demonstration 4.2.3.S: Use of the Short and Long Spine Board

NOTES

Equipment

Simulated automobile seat (or actual automobile)
Fellow student posing as a victim
Short spine board
Six straps
Cervical collar
Seven towels
Long spine board
Head- and chinstraps
Roller gauze
Two fellow students as assistants

Procedures

Assemble and have ready the equipment to make the demonstration realistic. Try to demonstrate using an actual automobile.

Inform the students you are going to assume the patient has no respiratory problems, severe hemorrhage, or cardiac problems.

Explain that the purpose of the demonstration is complete immobilization of the patient and not extrication.

Demonstrate so that all students can see and hear.

Describe each step as it is demonstrated.

Steps

Demonstrate in a vehicle, if possible, the following steps:

1. Review the need to conduct a primary survey.
2. Review the need to conduct a secondary survey.
3. Determine if gross deformities exist by visual examination.
4. Apply and maintain traction (review).
   a. Explain and demonstrate how.
   b. Show the placement of hands and fingers.
   c. Show how to exert pressure.
5. Conduct a spinal survey (review).
   a. Conscious patient
   b. Unconscious patient

6. Determine the equipment to be used.
   a. Explain the criteria for determination.
   b. Briefly discuss the equipment.
7. Attach a cervical collar (review).
   a. Explain and demonstrate how.
   b. Discuss alternate procedures.
      (1) Sandbags
      (2) Towels
      (3) Horse collar
8. Determine if a patient's position needs to be modified.
   a. Discuss the criteria for this determination.
   b. Explain why this is not a recommended procedure.
9. Modify the patient's position.
   a. Explain how to do this.
   b. Demonstrate how to do this.
   c. Explain what to do if the patient experiences pain or discomfort.
10. Prepare a short spine board.
   a. Explain and demonstrate how to attach the straps.
   b. Explain the position of the buckle.
11. Position a short spine board behind patient.
   a. Explain how; for example, the position of the board.
   b. Demonstrate how to do this.
12. Secure the patient to a short spine board.
   a. Explain and demonstrate how the straps are located around the torso.
   b. Explain and demonstrate what to do if the patient's shoulder blades will not conform to the short spine board.
   c. Explain and demonstrate how to pull the straps to secure the patient.
13. Fill the void between the neck and board with:
   a. Towel
   b. Air splint
14. Secure the patient's head using forehead straps and chin straps.
   a. Explain.
   b. Demonstrate the procedure and location of straps.
   c. Discuss alternate materials.
15. Fill an air splint so that it is firm.
16. Evaluate immobilization on a short spine board.
   a. Explain how to evaluate.

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b. Discuss procedures if the patient is not immobilized.

17. Determine if the patient's position needs to be modified to place him on long spine board.
    a. Explain why.
    b. Explain and demonstrate how to adjust position.
    c. Explain why this procedure is not recommended.
18. Position a long spine board next to the patient; demonstrate and explain how.
19. Rotate the patient so he is in position for a long spine board.
    a. Explain and demonstrate how.
    b. Explain why it is essential to not twist the torso when rotating the patient.
20. Lift the patient onto a long spine board.
    a. Explain and demonstrate how.
    b. Explain the location of assistants.
    c. Explain the necessity to avoid lifting the patient with a short spine board.
21. Release straps on the thighs.
    a. Explain and demonstrate how.
    b. Explain the need to keep the feet and legs supported.
22. Place rolled towels under voids.
    a. Explain and demonstrate how.
    b. Explain why.
    c. Explain the location of towels.
23. Secure the patient to a long spine board with straps.
    a. Explain and demonstrate how.
    b. Explain the location of straps.

After the demonstration has been completed, ask the students if they want to have any or all of the steps repeated. If time permits, have at least one student perform the demonstration and correct any errors that are observed.

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Demonstration 4.4.4.S: Log Roll of a Patient to a Long Spine Board

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Equipment

Straps
Towels
Long spine board
Four or five students as assistants

Procedure

Have equipment ready before demonstration is to begin.
Inform the students that this should be a review skill.
Demonstrate so that all students can see and hear.
Explain every step as it is demonstrated.

Steps

1. Review the need to do primary and secondary surveys.
2. Determine the amount of space available.
   a. Explain when to use a log roll.
   b. Explain when to use a straddle slide.
   c. Discuss the amount of space needed for both procedures.
3. Discuss the number of rescuers needed.
   a. Discuss the use of bystanders.
   b. Discuss the need for coordination.
4. Discuss the procedure for patients in:
   a. Supine position.
   b. Prone position.
5. Point out that the first rescuer stations himself at the patient's head.
   a. Demonstrate the application of traction (review).
   b. Explain why traction must be maintained.
6. Point out that the second rescuer raises patient's arm.
   a. Demonstrate the maneuver.
   b. Explain which arm is raised.
   c. Explain why the patient's arm is raised.
7. Point out that three rescuers position themselves next to the patient's side—demonstrate each position.

8. Point out that the second rescuer is at the patient's shoulder.
   a. Demonstrate the position of the hands.
   b. Explain grip.
9. Point out that the third rescuer is at the patient's buttocks.
   a. Demonstrate the position of the hands.
   b. Explain the grip.
10. Point out that the fourth rescuer is at the patient's knees.
   a. Demonstrate the position of the hands.
   b. Explain the grip.
11. Point out that the rescuers roll the patient on command.
   a. Explain who gives the command.
   b. Explain the duty of the rescuer at the patient's head.
   c. Explain the direction in which the patient is to be rolled.
   d. Demonstrate.
12. Point out that the second rescuer slides the board and places rolled towels in the void areas.
   a. Explain how to slide the board and its position.
   b. Explain the location of voids.
   c. Demonstrate.
13. Point out that the rescuers roll the patient on to a long spine board on command.
   a. Explain who gives the command.
   b. Explain the need for cooperation.
   c. Explain why the patient must be kept in a straight line.
   d. Demonstrate.
14. Point out that the rescuers must secure the patient to the board.
   a. Explain how.
   b. Explain the location of the straps.

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Demonstration 4.4.5.S: Straddle Slide

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Equipment

Long spine board
Towels
Straps
Student posing as a victim

Procedures

Have all equipment and materials ready.
Demonstrate so that all the students can see and hear.
Describe each step as it is demonstrated.

Steps

1. Review the need to do primary and secondary surveys.
2. Determine the amount of space available to function around the patient.
   a. Discuss the advantages of straddle slide in limited space.
   b. Discuss the disadvantages of log-roll technique.
3. Discuss the need for four rescuers.
4. Discuss the duties of the first rescuer.
   a. Discuss his position.
   b. Discuss his direction.
   c. Demonstrate the position and direction.
   d. Explain and demonstrate the application of traction.
      (1) Explain the need to maintain traction.
      (2) Explain the need to coordinate the lift with the other rescuers.
5. Discuss the duties of the second rescuer.
   a. Discuss his position.
   b. Discuss his direction.
   c. Discuss the position of his hands and how to grasp patient.
   d. Demonstrate the position, direction, and location of hands.
6. Discuss the duties of the third rescuer.
   a. Discuss his position.
   b. Discuss his direction.

c. Discuss the position and location of hands.
d. Demonstrate all of the above.

7. Discuss the duties of the fourth rescuer.
   a. Discuss position relative to patient.
   b. Discuss direction relative to patient.
   c. Discuss position of long spine board relative to patient.
   d. Demonstrate.
8. Point out that on command, the rescuers lift patient.
   a. Explain how; explain needed coordination.
   b. Explain the height the patient is to be lifted.
   c. Demonstrate using students at other positions.
9. Demonstrate how to slide the long board under the patient.
10. Demonstrate how to slowly lower the patient on to the board—explain the need for coordination.
11. Point out that the rescuers must fill in the voids.
   a. Explain where the voids are.
   b. Discuss the material to be used.
12. Demonstrate how to secure the patient to the board (review).
   a. Explain how to do this.
   b. Discuss the location of straps.

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Demonstration 4.4.6.S: Use of an Orthopedic Stretcher

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Equipment

Orthopedic stretcher
Student posing as victim
One or more students as assistants

Procedures

Have all equipment ready before the demonstration is to begin.
Demonstrate so that all students can see and hear.
Describe each step as it is performed.

Steps

1. Discuss the use of an orthopedic stretcher.
   a. Discuss the advantage and disadvantages for immobilizing the spine.
   b. Discuss advantages and disadvantages in a confined space.
   c. Show the equipment.
2. Discuss the operation of the stretcher.
   a. Show how it comes apart.
   b. Show how its length can be adjusted.
   c. Point out its head and lower section.
   d. Explain and demonstrate how the pillow detaches.
3. Review the need to do primary and secondary surveys.
4. Adjust the stretcher to the length of the patient.
   a. Review how to do this.
   b. Demonstrate again.
5. Remove the head support.
   a. Review how to do this.
   b. Demonstrate again.
6. Separate the stretcher.
   a. Review how to do this.
   b. Demonstrate again.
7. Place both halves of the stretcher beside the patient with the scoops facing the patient.
8. Place half of the stretcher under the patient.
   a. Explain and demonstrate how.

b. Explain how the patient is moved.
c. Be careful not to pinch the patient.

9. Scoop the patient onto the stretcher.
   a. Explain how and demonstrate.
   b. Explain why the upper part of the stretcher is fastened first.
   c. Explain how to lift the patient, then demonstrate.
10. Fasten the pillow to the frame.
   a. Demonstrate.
   b. Explain how to do this.
11. Secure the patient to the stretcher using the straps.
   a. Discuss the location of straps for prone and supine positions.
   b. Demonstrate.

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Practice Session 1

Equipment and Materials

Cervical collar
Sandbags
Towels
Straps
Blankets
Pencil or other suitable sharp object
Automobile
Short spine board
Six straps
Long spine board
Head- and chinstraps
Roller gauze
Victims (could be fellow students)

Procedure

Divide the class into two groups:

- One group practices:
  - — Maintaining traction, applying a cervical collar, and checking for paralysis on a conscious patient.
  - — Checking for paralysis on an unconscious victim.
- The second group practices the use of the long and short board.

Divide the equipment according to the skills to be practiced.

Circulate while the students practice the skills, and correct any errors that are observed.

Practice Session 2

Equipment

Towels
Straps

70

Long spine board
Orthopedic stretcher
Three students posing as victims.

Procedure

Divide the class into two groups.

- One group should practice:
  - — Straddle slide
  - — Log roll
- The other group should practice the use of the orthopedic stretcher.

Have the students switch when they feel they have had sufficient practice.

Divide the equipment according to the skills to be practiced.

Circulate among the students and correct any errors that are observed.

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Student's name _____

Date _____

Pass 1 2 3

Fail 1 2 3

Skill Evaluation 4.1.1.S: Spinal Survey of the Conscious Victim; Application of Traction, Cervical Collar, and Horse Collar; and Secondary Survey

Place an "X" in the appropriate column to indicate the steps that are incorrect, out of sequence, or omitted. The student should be given three attempts to perform the skill.

Equipment

Cervical collar
Student posing as victim
Towels
Straps
Blankets
Student as an assistant

Procedure

Have all the equipment and materials ready.
Assign one student as the assistant.
Inform the students on what they are to be evaluated:

- Inform them that they must do a primary and secondary survey.
- Inform them that they are to assume that the patient is conscious, that he has no airway problems, and that there is no severe hemorrhage.
- Inform them that they need not administer drugs, set up an IV, or administer oxygen.
- Further, inform them that they are to assume that the sympathetic nervous system has been affected.

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Inform the students that they may have a few minutes to practice, but you cannot help them.

Inform the students that they will switch roles after one of them is evaluated.

Start when the students are ready.

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Steps

Conduct primary and secondary surveys.

___ ___ ___ A. Determines if any gross deformity is present by visual examination.

(Instructor is to inform the student that no gross deformity exists.)

___ ___ ___ B. Applies traction by grasping the patient's head with his fingers at the base of the patient's skull and thumbs under the patient's chin and exerts a steady outward pull. Maintains traction during the entire procedure.

___ ___ ___ C. Determines if the patient is conscious.

(Instructor is to inform the student that the patient is conscious.)

___ ___ ___ D. Asks patient which area of the spine is injured and to describe any tenderness or discomfort.

___ ___ ___ E. Moves his fingers along the spine to determine any increase or decrease in pain upon touch.

___ ___ ___ F. Checks the lower extremities.

___ ___ ___ 1. Touches the feet and asks the patient if feeling is present.

___ ___ ___ 2. Asks the patient to wiggle his toes.

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___ ___ ___ 3. Asks the patient to raise his legs.

___ ___ ___ 4. Asks the patient to press his foot against the student's hand.

___ ___ ___ 5. Asks the patient if his toe is being moved up or down.

___ ___ ___ G. Checks the upper extremities.

___ ___ ___ 1. Touches the patient's palm, and asks if feeling is present.

___ ___ ___ 2. Asks the patient to wiggle his fingers.

___ ___ ___ 3. Asks the patient to raise his arms.

___ ___ ___ 4. Asks the patient to squeeze the student's hand.

___ ___ ___ 5. Asks the patient if his finger is being moved up or down.

___ ___ ___ H. Determines the possible location of spinal injury.

(Instructor is to inform the student which equipment to use. Student must demonstrate the use of it all.)

___ ___ ___ I. Places a cervical collar around the patient's neck and secures it in position without inhibiting the airway or carotid circulation.

___ ___ ___ J. Places a towel around the patient's neck to make a horse collar. Secures the ends of the towel with straps around the patient's chest.

___ ___ ___ K. Places sandbags parallel to the patient's cervical spine.

___ ___ ___ L. Covers the patient with blankets.

NOTES

Student's name_____

Date_____

Pass 1 2 3

Fail 1 2 3

Skill Evaluation 4.1.2.S: Spinal Survey of the Unconscious Victim

Place an "X" in the appropriate column to indicate the steps that are incorrect, out of sequence, or omitted. The student should be given three attempts to perform the skill.

Equipment

Student posing as a victim
Student acting as an assistant
Pencil or suitable sharp object

Procedures

- Have all the equipment and materials ready.
- Inform the students on what they are to be evaluated.
  - — Need only make a paralysis check of an unconscious patient
  - — No need to assume the patient has a damaged sympathetic nervous system
- Further inform the students that a primary and secondary survey have already been conducted and that the patient has no cardiac or respiratory problems.
- Inform the students of their roles.
  - — The assistant is only to maintain traction while one student performs the check for paralysis.
  - — Students will switch roles after their completion.

NOTES

- **Give the students an opportunity to practice the skills, but inform them you cannot help.**
- **Start when the students are ready.**

NOTES

Steps

___ ___ ___ A. Determines if any gross deformity is present by visual examination.

(Instructor is to inform the student that no gross deformities are present.)

___ ___ ___ B. Assistant applies traction by grasping the patient's head with his fingers at the base of the skull and with his thumbs under the patient's chin, exerts a steady outward pull. Maintains traction during entire procedure.

___ ___ ___ C. Determines if the patient is conscious by assessing the communicative ability of the patient.

___ ___ ___ D. Moves his fingers along spinal column to determine if there are any deformities, hemorrhage, or bruises are present.

___ ___ ___ E. Checks the lower extremities for paralysis by jabbing the bottom of the patient's feet with a pointed object. Observes for the curling of toes.

___ ___ ___ F. Checks the upper extremities for paralysis by jabbing the palm of the hand with a pointed object. Observes for the hand pulling away.

___ ___ ___ G. Determines the location of spinal injury by the results obtained during the paralysis check.

Student's name_____

Date _____

Short spine board				Long spine board			
Pass	1	2	3	Pass	1	2	3
Fail	1	2	3	Fail	1	2	3

Skill Evaluation 4.2.3.S: Short and Long Spine Board Application

Place an "X" in the appropriate column to indicate the steps that are incorrect, out of sequence, or omitted. The student should be given three attempts to perform the skill.

Equipment

Automobile
Fellow student posing as victim
Short spine board
Six straps
Cervical collar
Seven towels
Long spine board
Head- and chinstraps
Roller gauze
Two fellow students as assistants

Procedures

Have the equipment and materials ready.

Inform the students on what they are to be evaluated. (Read Skill Objective 4.2.3.S to the students.)

- Be sure they understand the role of the assistants.
- Be sure they understand they have to completely immobilize the patient.
- Be sure they understand they are to do a primary survey and a secondary survey and to assume the patient has no respiratory, cardiac, or hemorrhage problems.

NOTES

Give the students an opportunity to practice the skill and examine the equipment; but inform them that you cannot help them during this time.

Start when the students are ready.

NOTES

Steps

Conduct primary and secondary surveys.

___ ___ ___ A. Determines if any gross deformities are present by visual examination.

___ ___ ___ B. Applies and maintains traction (assistant only).

___ ___ ___ C. Conducts a spinal survey (victim is conscious).

___ ___ ___ D. Determines the equipment to be used by examining the patient's injury, location, and the space available.

___ ___ ___ E. Attaches a cervical collar to patient's neck.

___ ___ ___ F. Obtains the equipment.

___ ___ ___ G. Determines if the patient's position needs to be modified before the patient can be immobilized (not recommended).

___ ___ ___ H. Adjusts the patient's position (if needed) by supporting the patient along the entire spine and legs. (This adjustment is not recommended. If it is performed and the patient feels discomfort, move patient to a more comfortable position.)

___ ___ ___ I. Prepares a short spine board by inserting two straps making an "X" on the back of the board. Buckles must be on the front.

___ ___ ___ J. Positions the board behind the patient with Velcro stripping facing away from the back of

the patient's head. Board should not be placed to the level of the seat of the automobile.

NOTES

___ ___ ___ K. Secures the patient to a short spine board by buckling the two straps. Buckle must be on the patient's chest, while straps go around the thighs. NOTE: Material may be needed to build the board out for patient depending on the configuration of the patient's back.

___ ___ ___ L. Tightens the patient's torso to the board by pulling on each strap simultaneously.

___ ___ ___ M. Fills the void between the patient's neck and board with a towel or air splint and secures the patient's head to the board using chinstraps and forehead straps. Traction may be released at this time. Fills the air splint until firm.

___ ___ ___ N. Evaluates the immobilization; that is, checks the straps, etc.

___ ___ ___ O. Lifts the patient by lifting the patient's shoulders; then, slides a long board under the patient (assistants only). (Do not lift the patient with short spine board.)

___ ___ ___ P. Rotates the patient making sure not to twist his body and lays the patient on long spine board while the assistant supports the patient's feet and legs.

___ ___ ___ Q. Releases the straps on the thighs and slowly and carefully lowers the patient's legs.

___ ___ ___ R. Places rolled towels under the knees, ankles, and small of back.

___ ___ ___ S. Secures the patient with straps around the chest, pelvis, and lower thigh.

___ ___ ___ T. Elevates to determine if the patient is completely immobilized.

Student's name_____

Date _____

Team names 1 _____

2 _____

3 _____

4 _____

5 _____

Pass 1 2 3

Fail 1 2 3

NOTES

Skill Evaluation 4.4.4.S: Log Roll Onto a Long Spine Board

Place an "X" in the appropriate column to indicate the steps that are incorrect, out of sequence, or omitted. The student should be given three attempts to perform the skill.

Equipment

Straps
Towels
Long spine board
Five students
Student posing as a victim

Procedures

Have equipment and materials ready.

Inform the students on what they are to be evaluated—to log roll the patient onto the long board without causing any further damage.

Inform the students that they will be evaluated as a team.

Give them an opportunity to practice.

Start when they are ready.

NOTES

___ ___ ___ A. Primary and secondary surveys are conducted.

(Instructor informs the team of suspected spine injury.)

___ ___ ___ B. First rescuer applies traction at the head of the patient and maintains it through the entire procedure.

___ ___ ___ C. Second rescuer raises the patient's arm above patient's head on the side to which the patient is to be rolled.

___ ___ ___ D. Remaining three rescuers position themselves:

___ ___ ___ 1. Third rescuer at the patient's shoulders

___ ___ ___ 2. Fourth rescuer at the patient's buttocks; about midthigh

___ ___ ___ 3. Fifth rescuer at the patient's knees

All rescuers should be kneeling on the same knee, positioned next to the patient's side.

___ ___ ___ E. Third rescuer places one hand on the patient's farthest shoulder and the other over the patient's arm just below belt line.

___ ___ ___ F. Fourth rescuer places one hand above the patient's buttocks and the other hand around the patient's midthigh.

___ ___ ___ G. Fifth rescuer places one hand behind the patient's knee and the other hand on the patient's leg just below the calf.

___ ___ ___ H. On command of first rescuer (head man), the four rescuers roll the patient toward them,

keeping the patient in a straight line. The first rescuer rotates the patient's head along with the other three rescuers.

NOTES

___ ___ ___ I. Second rescuer slides the long spine board next to the patient.

___ ___ ___ J. Second rescuer places pads (rolled towels) at points where a void will be created by the patient's body.

___ ___ ___ 1. Neck

___ ___ ___ 2. Small of back

___ ___ ___ 3. Under knees

___ ___ ___ 4. Under ankles

___ ___ ___ K. On command of the first rescuer (head man), the four rescuers roll the patient onto the spine board. First rescuer rotates the patient's head along with the other three rescuers.

___ ___ ___ L. Patient is secured to the board with straps at the chest, thighs, and knees.

Student's name _____

Date _____

Team names 1 _____

2 _____

3 _____

4 _____

5 _____

Pass 1 2 3

Fail 1 2 3

Skill Evaluation 4.4.5.S: Straddle Slide

Place an "X" in the appropriate column to indicate the steps that are incorrect, out of sequence, or omitted. The student should be given three attempts to perform the skill.

Equipment

Long spine board
Towels
Straps
Student posing as victim

Procedures

Have equipment and materials ready.

Inform the students on what they are going to be evaluated. Also inform them that they are going to be evaluated as a team—four members.

Give the students an opportunity to practice the skill as a team, but inform them that you cannot help.

NOTES

Steps

NOTES

___ ___ ___ A. Primary and secondary surveys are conducted.

___ ___ ___ B. First rescuer stands at the patient's head facing the patient's feet, spreads the legs, bends at the waist, and applies and maintains traction throughout the entire procedure.

___ ___ ___ C. Second rescuer straddles the patient facing the first rescuer and places his hands under the patient's arm just below the shoulders.

___ ___ ___ D. Third rescuer straddles the patient facing the first rescuer and places his hands under the patient's waist.

___ ___ ___ E. Fourth rescuer positions himself at the head of the patient straddling the long spine board. (Spine board must be lengthwise at the patient's head.)

___ ___ ___ F. First rescuer gives the command to lift the patient.

___ ___ ___ G. Patient is lifted just enough for the fourth rescuer to slide the long spine board under the patient.

___ ___ ___ H. Board is slid under the patient.

___ ___ ___ I. Patient is lowered onto the board.

___ ___ ___ J. Voids are padded with towels; that is, the neck, small of the back, and under the knees and ankles.

___ ___ ___ K. Patient is secured to the board with straps at the chest, thighs, and knees.

Student's name _____

Date _____

Pass 1 2 3

Fail 1 2 3

Skill Evaluation 4.4.6.S: Use of an Orthopedic Stretcher

Place an "X" in the appropriate column to indicate the steps that are incorrect, out of sequence, or omitted. The student should be given three attempts to perform the skill.

Equipment

Orthopedic stretcher
Student posing as a victim

Procedures

Have equipment and materials ready.
Inform the students on what they are to be evaluated.
Give them an opportunity to practice, but inform them that you cannot help.
Begin when the students are ready.

Steps

___ ___ ___ A. Does primary and secondary surveys.

(Instructor is to inform the student that the survey reveals lower back injury.)

___ ___ ___ B. Assistant applies and maintains traction during the entire procedure.

___ ___ ___ C. Unfolds the orthopedic stretcher.

___ ___ ___ D. Adjusts the length to fit the patient by sliding the lower end into the upper end and locking it into position with lock pegs.

NOTES

NOTES

___ ___ ___ E. Removes the head support by pulling the vinyl flaps away from the top piece of the pillow.

___ ___ ___ F. Separates both halves of the stretcher by grasping the head part of the stretcher and depressing the catch device, and then applying outward pressure.

___ ___ ___ G. Repeats Step F for the lower part of the stretcher.

___ ___ ___ H. Places half of the stretcher on one side of the patient and the other half on the other side, with scoop blades toward the patient's body and the pillow part at the patient's head.

___ ___ ___ I. Places half of the stretcher under the patient by having the assistant from the other side of the the patient gently lift patient (being careful not to pinch the patient).

___ ___ ___ J. Places the other half of the stretcher next to the patient and connects the two halves together at the head of the stretcher using the catch device.

___ ___ ___ K. Scoops the patient into the stretcher by having the assistant lift the remaining side of patient and by closing the lower part of stretcher together (being careful not to pinch the patient).

___ ___ ___ L. Locks the lower part of the stretcher together using the catch device.

___ ___ ___ M. Slides the pillow under the stretcher frame with Velcro stripping facing upward.

___ ___ ___ N. Secures the patient with straps across the chest, hips, and lower thighs.

___ ___ ___ O. Evaluates the immobilization.

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